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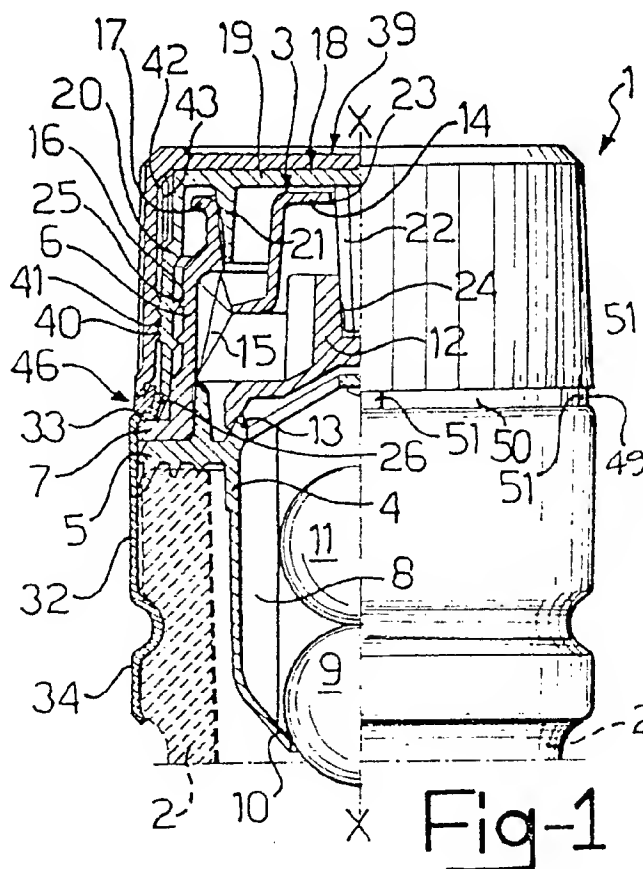
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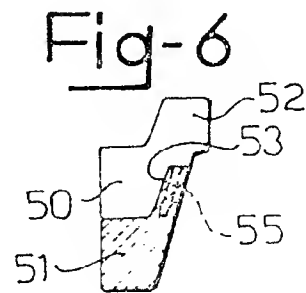
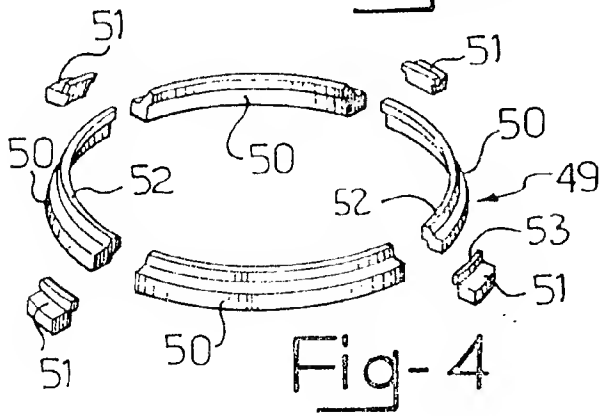
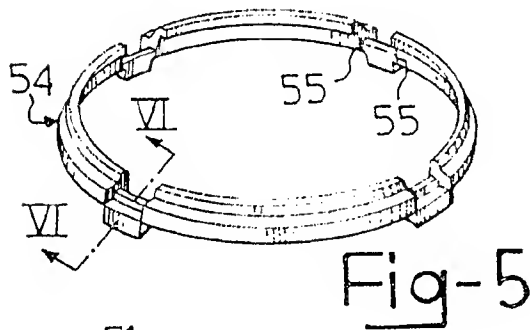
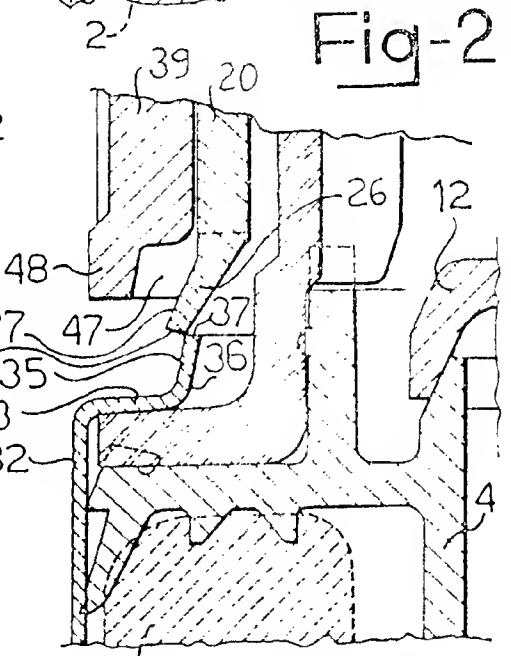
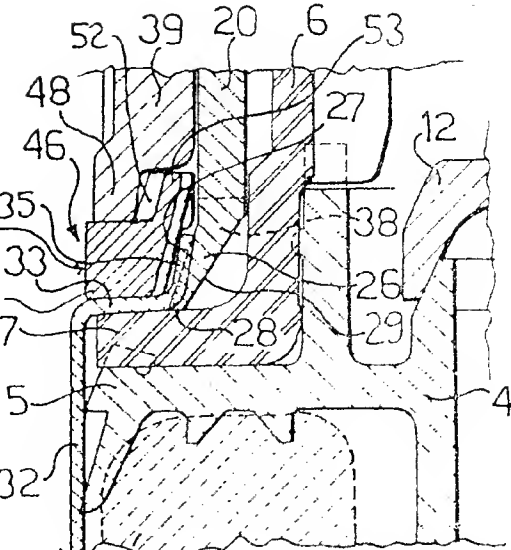
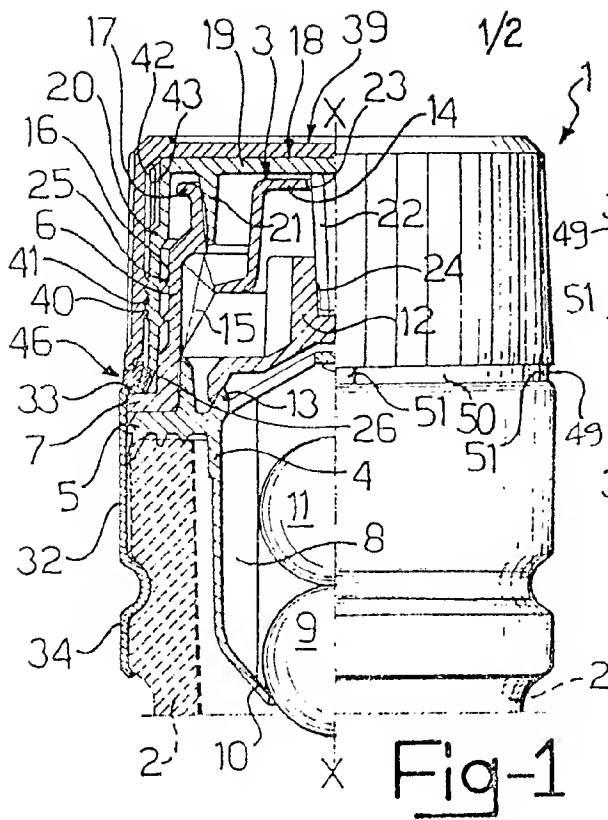
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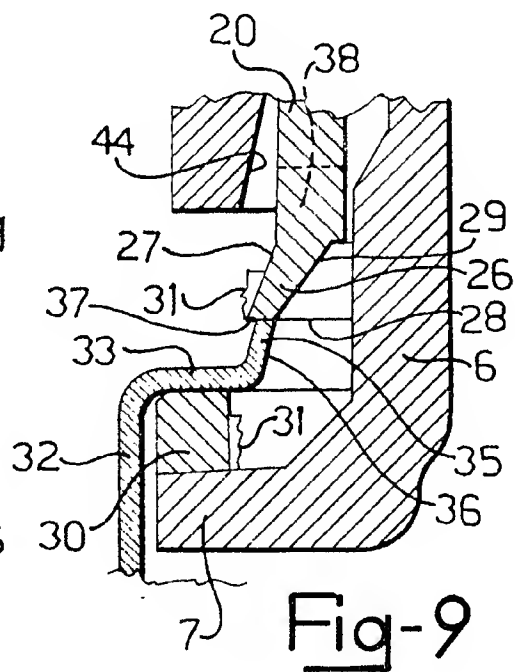
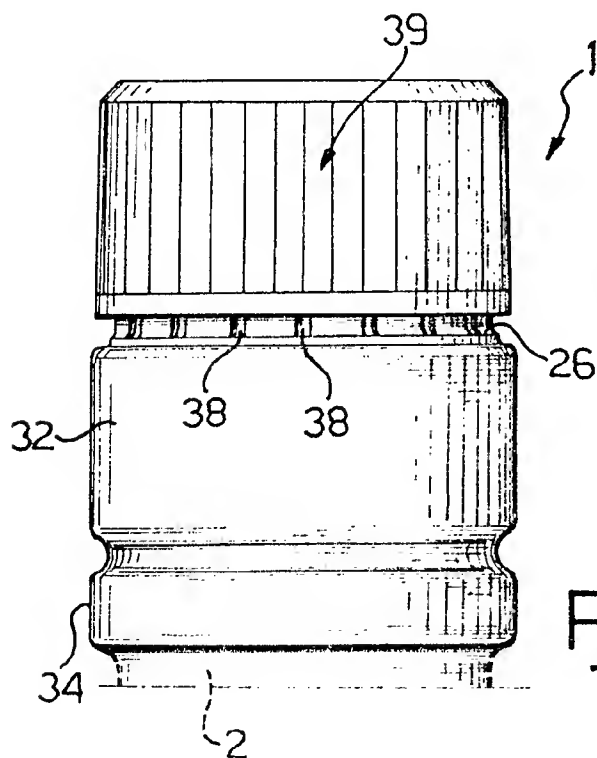
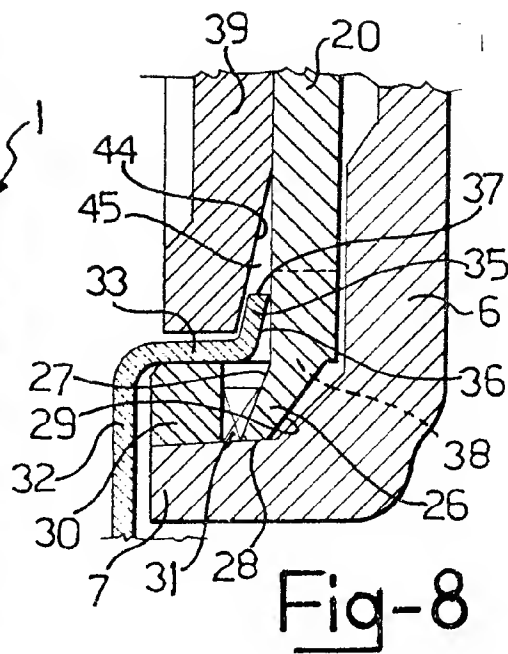
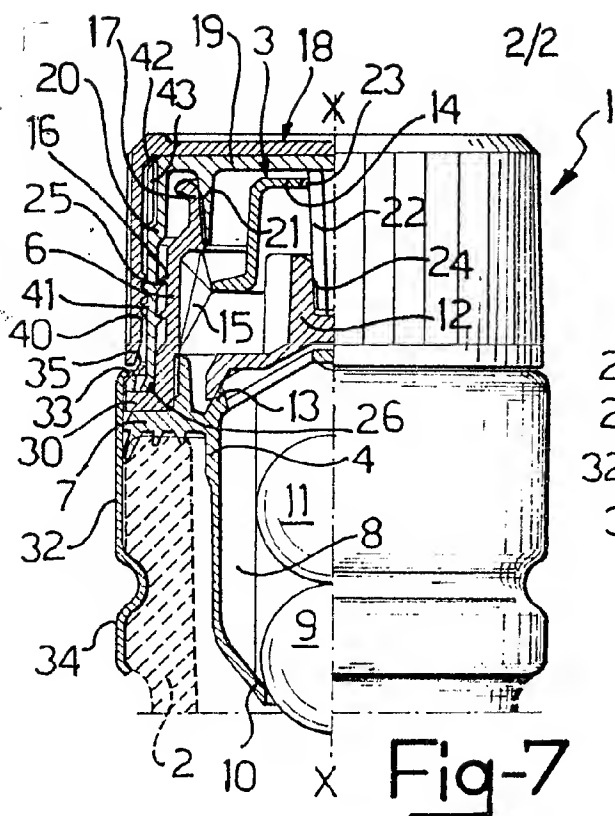
(54) **Security closure for bottles**

(57) A security closure (1) for bottles, adapted to render evident any fraudulent opening and reclosing, comprises a pourer (6), a stopper cap (18), an outer annular projection (26) projecting from the stopper cap (18) and having an inclined back, an external metal band (32) having a bent edge portion (33) for retaining the pourer (6) on the bottle (2), and an annular lip (35) projecting from the edge portion (33) and inclined upwardly and inwardly for cooperating with the projection (26).



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## SPECIFICATION

### Security closure for bottles

- 5 The present invention relates to a security closure for bottles.

Such closures are used at present to render obvious the fact that a bottle has been opened and reclosed, possibly fraudulently.

- 10 In fact, such closures do not reassume their initial appearance when the stopper is screwed back on after its first unscrewing. Thus, a bottle which has been fraudulently opened can be distinguished from other intact bottles, for example from among those on sale in a supermarket.

One example of a closure of the type specified is that described in Italian Patent No. 793,760 of the present Applicants.

- 20 With this closure, when the stopper is screwed back onto the central body, it does not reach the initial axial position it had prior to the first unscrewing but is stopped before the engagement of the annular projection against the ring. The configuration of this closure when the stopper is screwed back on is therefore only slightly different from the initial configuration, so that the occurrence of opening is not readily recognisable, particularly by a hasty purchaser.

- The problem behind the present invention is that of providing a security closure for bottles which has structural and functional characteristics such that it presents a marked and more recognisable difference between the configuration of a violated closure and the configuration of an intact closure.

- This problem is solved by a security closure including a pourer, a stopper cap, an outer annular projection projecting from the stopper cap and having an inclined dorsal surface, an external metal band having a bent edge portion for retaining the pourer on the bottle, and an annular lip projecting from the edge portion and inclined upwardly and inwardly for cooperating with the projection.

- Further characteristics and advantages of the closure according to the present invention will become apparent from the following description of a preferred embodiment, given by way of non-limiting example with reference to the appended drawings, in which:

Figure 1 is a partially sectioned view of a closure according to the invention,

- 55 Figure 2 is a sectional view of a detail of the closure of Figure 1 on an enlarged scale,

Figure 3 is a view of the same detail as Figure 2 in a different position of operation of the closure,

- 60 Figure 4 is a perspective view of a detail of the closure of Figure 1, shown with the parts separated,

Figure 5 is a perspective view of the detail of Figure 4 as obtained by moulding,

- 65 Figure 6 is a sectional view of a detail of

Figure 5,

Figure 7 is a partially sectioned view of a variant of the embodiment of the closure according to the invention,

- 70 Figure 8 is a sectional view of a detail of the closure of Figure 7 on an enlarged scale,

Figure 9 is a view of a detail of Figure 8 in a different position of operation of the closure, and

- 75 Figure 10 is a view of the closure of Figure 7 in a different position of operation.

With reference to the appended drawings, there is generally indicated 1 a security closure for a bottle 2 of which there is shown in broken outline only its upwardly open neck portion having an axis X-X.

- 80 The closure 1 comprises a central body 3 which extends along the axis X-X and is formed by a first tubular member 4 partially inserted in the neck of the bottle 2 and having a peripheral flange 5 bearing thereon, and by a second tubular member 6, termed a pourer, press fitted onto the first member 4 as an extension thereof and having a peripheral flange 7 bearing against the flange 5.

The first member 4 and the second member 6 are made from suitable plastics materials, for example polythene and polystyrene respectively.

- 95 The first tubular member 4 is formed with an internal cage 8 for retaining and guiding along the axis X-X a first glass ball 9 which acts as a shutter for the central body 3 and is movable towards and away from a shutter seat 10 formed in the first tubular member 4, as well as second glass ball 11 which acts as a striker for the first ball 9.

- A bell shutter 12 is movable in the second tubular member 6 between a shutter seat 13 formed in the first tubular member 4 and a base stop 14 fixed to the second tubular member 6 by spokes 15.

- The second tubular member 6 of the central body 3 has external screw threading 16 and terminates with a drip-preventing lip 17.

- 110 The closure 1 also includes a stopper cap 18 having an end wall 19 and a downwardly-facing cylindrical skirt 20 with an axis X-X. The stopper 18 is formed from a suitable plastics material such as polypropylene.

- 115 A thin tubular appendage 21 with an axis X-X projects downwardly from the end wall 19 and is inserted with a fluid-tight seal in the drip-preventing lip 17, and a torsionally rigid splined boss 22 with an axis X-X extends through a hole 23 in the base 14 into engagement with a grooved seat 24 in the bell shutter 12.

- The cylindrical skirt 20 of the stopper cap 18 has internal screw threading 25 engaged with the threading 16 of the second tubular member 6.

- 120 An outer annular projection 26 projects from the cylindrical skirt 20 of the stopper cap 18 at its downwardly-facing free end.

This projection 26 has a saw-toothed profile with an inclined dorsal surface 27 and a downwardly-facing frontal surface 28. To advantage, the stopper cap 18 has a bevel 29 formed internally on its downwardly-facing free edge. This bevel 29 gives the projection 26 a predetermined degree of resilient yieldability.

The closure 1 further includes an external metal band 32, for example of aluminium alloy, which is fitted around the flanges 7, 5 and the neck of the bottle 2.

The band 32 has an upper edge portion 33 bent horizontally over the flange 7 and a lower portion 34 deformed into an S-shape to engage an S-profile on the neck of the bottle 2. The band 32 thus retains the pourer 6 of the central body 3 on the bottle 2.

The upper edge portion 33 has an annular lip 35 inclined upwardly and inwardly, and located above the dorsal surface 27 of the projection 26.

The lip 35 has an inner surface 36 with an inclination substantially the same as the inclination of the dorsal surface 27, and a flat frontal apex 37.

At the free end of its skirt 20, the stopper cap 18 has a plurality of spaced-apart apertures, all indicated 38.

A stopper cover 39 is press-fitted onto the stopper cap 18 and is formed of a suitable plastics material, for example polypropylene. To advantage, the polypropylene of the stopper cap 18 and that of the stopper cover 39 are of different colours so that there is a colour contrast between the stopper 18 and the stopper cover 39.

The stopper cover 39 is retained axially on the stopper 18 by the snap-engagement of annular projections 40 and 41 formed respectively on the inside of the stopper cover and the outside of the stopper.

As regards the fixing of the stopper cover 39 to the stopper 18 for rotation therewith, this is achieved by axial teeth 42 and 43 formed respectively on the inside of the stopper cover and the outside the stopper and engaged with each other by a splined coupling.

The stopper cover 39 is externally knurled in an entirely conventional manner and defines an annular seat 46 in correspondence with the projection 26 defined by the edge portion 33 and the lip 35. The annular seat 46 includes an annular recess 47 defined by an overhang 48 formed on the stopper cover 39.

The ring 49 is formed by a plurality of sectors of different angular extents. In particular, it includes four sectors, each indicated 50, having a larger angular extent, for example 60°, and four sectors, each indicated 51, having a smaller angular extent, for example 30° disposed alternately.

Each sector 50 (51) is formed with an edge

52 (53) which is housed in the recess 47.

It should be noted that the edges 52 of the sectors 50 have sections of such a size as to be housed in the recess 47 with a small clearance, substantially wedged between the overhang 48 and the skirt 20.

The edges 53 of the sectors 51, however, have sections of such a size as to be housed in the recess 47 with a large clearance so as to be loose between the overhang 48 and the skirt 20.

It should also be noted that the sectors 50 and 51 are made by moulding in a single, substantially annular piece, indicated 54, preferably made from polystyrene.

The sectors 50 and 51 are axially offset from each other in the piece 54 and are interconnected by rupturable links, each indicated 55.

In particular, the sectors 50 and 51 are staggered so that the sectors 51 are connected to the sectors 50 in correspondence with the edges 53.

The piece 54 is arranged in advance of the cap-shaped stopper cover 39. During fitting of the stopper cover 39 onto the stopper 18, the links 55 are broken and the sectors 50, 51 arrange themselves coplanarly so as to form the ring 49.

The operation of the closure 1 according to the invention is described below with reference to an initial condition illustrated in Figures 1 and 2, in which the closure is intact.

When the assembly constituted by the stopper cover 39 and the stopper 18 is unscrewed, the projection snaps over the lip 35 and at the same time the distance between the stopper cover 39 and the edge 33 increases.

Hence, on the one hand, the snap action produces a noise which indicates the correct unscrewing and, on the other hand, the annular seat 46 is opened. This opening causes the release of the sectors 50 and 51 which, not being retained, fall from the closure.

When the stopper is screwed back onto the central body, it no longer reaches the initial position described above but is stopped before this in a position shown in Figure 3, in which the surface 28 of the projection 26 bears against the facing apex 37 of the annular lip 35.

Furthermore, it does not have the ring 49. This ring, in fact, cannot be put back into use fraudulently due to the practical impossibility of recovering and assembling the sectors 50, 51 and holding them during the screwing up of the stopper. In particular, it is practically impossible to hold the sectors 51 which are housed loosely in the seat 46.

In this position, the free end of the stopper 18 is clearly visible, this visibility being accentuated by the presence of the apertures 38 in the stopper 18 and by the contrast in colour between the stopper cover and the stopper.

With reference to Figures 7, 8, 9 and 10, a closure according to a variant of the embodiment of the invention is described below.

In order not to overburden the description, the parts corresponding to those of the closure of Figures 1 to 6 have the same reference numerals and will not be described below.

According to this variant, the closure 1 includes a ring 30 of polypropylene which extends coaxially outside the stopper cap 18 at the level of and surrounding the dorsal surface 27 of the projection 26. The ring 30 is engaged with the dorsal surface 27 of the projection 26 to which it is connected by a plurality of rupturable radial links, each indicated 31, and bears on the flange 7 of the second member 6 of the central body 3.

The band 32 is fitted onto the ring 30 and is bent horizontally over the edge portion 33. Thus, the band 32 retains the ring 30 and hence the stopper cap 18 on the bottle 2.

The stopper cover 39 extends over the stopper 18 as far as the apertures 38 and has an internal bevel 44 which defines a seat 45 for the annular lip 35.

The operation of the closure 1 according to this variant is described below with reference to an initial condition illustrated in Figures 7 and 8, in which the closure is intact.

As the unscrewing of the assembly constituted by the stopper cover 39 and the stopper 18 is started, the rupturable links 31 are broken and the projection 26 is therefore separated and removed from the ring 30. This ring 30 is in fact retained on the pourer body 3 and the bottle 2 by the presence of the band 32.

As the unscrewing is continued, the projection 26 engages and snaps over the annular lip 35. In particular, this engagement occurs between the dorsal surface 27 of the projection 26 and the inner surface 36 of the annular lip 35.

This snapping over is accompanied by a sharp noise which indicates the correct unscrewing of the stopper. This unscrewing is continued until the stopper itself is removed completely.

When the stopper is screwed back onto the central body, it no longer reaches the initial position described above but is stopped prior to this in a position shown in Figures 9 and 10, in which the surface 28 of the projection 26 bears against the facing apex 37 of the annular lip 35.

In this position, the free end of the stopper 18 is clearly visible, this visibility being accentuated by the presence of the apertures 38 in the stopper 18 and by the contrast in colour between the stopper cover and the stopper.

The closure according to the invention renders the occurrence of the opening and reclosing of the bottle considerably more recognisable.

## CLAIMS

1. Security closure for bottles, comprising a pourer, a stopper cap, an outer annular projection projecting from the stopper cap and having an inclined dorsal surface, an external metal band having a bent edge portion for retaining the pourer on the bottle, and an annular lip projecting from the edge portion and inclined upwardly and inwardly for cooperating with the projection.

2. Security closure according to Claim 1, in which the annular inclined lip has an inclination substantially the same as the inclination of the dorsal surface of the annular projection.

3. Security closure according to Claim 2, including a cap-shaped stopper cover press-fitted onto the outside of the stopper cap and defining an annular seat in correspondence with the projection, and a ring housed in the annular seat.

4. Security closure according to Claim 3, in which the ring is formed by a plurality of sectors.

5. Security closure according to Claim 4, in which the sectors of the ring are housed in the seat with large and small clearances alternately.

6. Security closure according to Claim 5, in which the sectors of the ring are connected together by rupturable links.

7. Security closure according to Claim 2, including a ring located between the pourer and the edge portion and connected to the annular projection by rupturable links.

8. Security closure according to Claim 2, including a plurality of apertures formed in the stopper cap in correspondence with the annular projection and spaced therearound.

9. Security closure according to Claim 8, including a cap-shaped stopper cover which is press-fitted onto the outside of the stopper cap as far as the apertures and is in colour contrast with the stopper cap.

10. Security closure according to Claim 2, in which the projection has a predetermined degree of resilient yieldability so as to snap over the annular lip with the emission of a noise.

11. Security closure for bottles, substantially as herein described with reference to, and as shown in, the accompanying drawings.

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